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North America

Environmental Markets| Emissions

EPA Proposes Mandatory Methane Reduction Despite Declining Emissions

Regulatory Burden Costlier Than Current Market Driven-Incentives

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Policy Brief

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Key Takeaways:

- The Environmental Protection Agency's proposal to reduce methane emissions from the oil and gas sector would impose millions of dollars in annualized regulatory burdens despite substantial methane reductions driven by current market incentives
- The proposed regulations would add to the existing burden on oil and gas companies, which are currently suffering from low and falling commodity prices
- Industry finds mandatory methane reductions unnecessary as innovative voluntary approaches have already resulted in substantial fall in emissions

Entities Mentioned:

- America's Natural Gas Alliance
- American Petroleum Institute
- Clean Air Task Force
- Department of the Interior
- Environmental Defense Fund
- Environmental Protection Agency
- Independent Petroleum Association of America
- Southwestern Energy

Related Research

Final Clean Power Plan Sets Tougher Emissions Reduction Goals Under Extended Timeframes

EPA Announces New Emissions Standards for Trucks and Trailers

Insight for Industry – EPA's Proposed Methane Regulations would Increase Burden for Oil and Gas Industry, Impose Significant Compliance Costs Contrary to Voluntary Efforts Driven by Market Incentives

On August 18, 2015, the Environmental Protection Agency (EPA) proposed the first national standards for methane emissions from the oil and gas sector as part of the 2013 Climate Action Plan aiming to reduce emissions of methane – the primary component of natural gas – by 40-45 percent below 2012 levels by 2025. The standards target new and modified oil and gas wells, processing equipment, and storage facilities, while omitting existing wells. The EPA estimates the proposed rule to cost $320 to $420 million in 2025 while providing total benefits of $460 million to $550 million. The proposal opens a 60-day comment period and is expected to be finalized in 2016.

The proposed regulations would be burdensome for the oil and gas industry, which is already facing consistently falling commodity prices that have resulted in lower profits. Weak natural gas prices and additional compliance requirements would increase costs especially for companies involved in natural gas production and transmission.

Many in the oil and gas industry – especially those involved in production of both oil and natural gas – argue that the proposal is unnecessary given the substantial decline in methane emissions from natural gas wells over the past few years. Furthermore, mandatory reductions are unnecessary as the industry is already motivated by the possibility of selling the captured methane.

On the other hand, environmentalists commend the proposal, emphasizing the need to expand the regulations to existing sources to meet the 2025 goal. The Environmental Defense Fund has criticized the proposal for disregarding existing sources, which will account for an estimated 90 percent of methane emissions in 2018.

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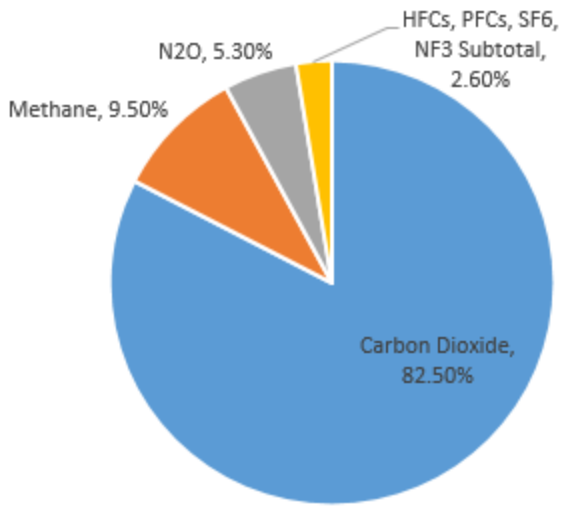
In August, the EPA issued regulations for fossil fuel-fired power plants, with a goal to reduce carbon dioxide emissions by 32 percent by 2030. The EPA has also used its authority under the Clean Air Act to impose stricter fuel economy standards for vehicles. The Agency's efforts are considered as an important step toward achieving emissions reduction goals as the U.S. seeks to demonstrate leadership for a global climate agreement this year in Paris. On March 31, the U.S. submitted its greenhouse gas reductions target to the United Nations Framework Convention on Climate Change (UNFCCC), committing to reduce U.S. emissions by 26-28 percent below 2005 levels by 2025, and to make best efforts to reduce by 28 percent. Currently, methane represents approximately 9.5 percent of U.S. greenhouse gas emissions while carbon dioxide (CO_2) represents 82.5 percent (Figure 1).

Figure 1 - 2013 Greenhouse Gas Emissions (Based on MMT CO2 Eq.)



Source: EPA

Industry Says Mandatory Requirements Unnecessary while Environmental Groups Seek Inclusion of Existing Sources

The Independent Petroleum Association of America (IPAA), an organization representing independent oil and gas producers, stated that the new regulations would result in unnecessary costs and uncertainties, and that additional regulations are not necessary as Clean Air Act regulations will achieve the 2025 methane reduction goal under the Climate Action Plan. The IPAA pointed that the EPA deemed a voluntary program as sufficient for the agriculture industry, which emits three times more methane than the oil and gas sector.

The American Petroleum Institute (API) called the proposal duplicative and costly, saying that the industry has already reduced methane emissions significantly through innovation and existing measures. Despite the surge in oil and natural gas production, methane emissions from hydraulically fractured natural gas wells have declined by approximately 79 percent since 2005 and carbon dioxide emissions have fallen to 27-year lows.

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Similarly, America's Natural Gas Alliance (ANGA), another industry group, argued that a collaborative approach would facilitate faster and better reductions compared to new and unnecessary regulation. Sen. Heidi Heitkamp (D-ND) warned that adding potentially costly regulations at a time when the industry is affected by lower oil costs could adversely impact jobs.

On the other side, the Clean Air Task Force, a nonprofit dedicated to reducing air pollution, stated that the proposal sets the stage for rules to address emissions from older oil and gas fields.

Similarly, Colorado Governor John Hickenlooper (D) expressed support for the proposal, citing that it follows the model in Colorado, which became the first U.S. state to directly regulate methane emissions in 2014.

EPA Proposal Sets First National Limits on Methane Emissions from New and Modified Sources in the Oil and Gas Sector

The EPA's proposal would amend the 2012 New Source Performance Standards (NSPS) for the oil and natural gas industry to include methane reductions and additional reductions in volatile organic compounds (VOCs). It is part of a broader effort under the Climate Action Plan to achieve 40-45 percent reduction in methane emissions by 2025 relative to 2012 levels. According to the EPA, regulating methane from sources that are currently regulated for VOC emissions would provide more consistency across the category. As the best system of emission reduction (BSER) for methane is the same as that for VOCs, sources already subject to the 2012 NSPS for VOC reductions and covered by the proposed 2015 methane requirements would not have to install additional controls.

The proposed standards primarily target methane and VOC emissions from new and modified sources across the oil and natural gas industry, requiring owners and operators to:

- Find and repair leaks, a significant source of both methane and VOCs;
- Capture natural gas from the completion of hydraulically fractured oil wells using "reduced emissions completion" or "green completion" process;
- Limit emissions from new and modified pneumatic pumps used throughout the industry from well sites to transmission compressor stations;
- Limit emissions from several equipment types used at natural gas transmission compressor stations and storage facilities, including compressors and pneumatic controllers.

The proposal includes guidelines for states to reduce VOC emissions from existing sources in certain ozone nonattainment areas and the mid-Atlantic and northeastern states in the Ozone Transport Region. It also includes updates to clarify the EPA's air permitting requirements in states and Indian country, thereby improving efficiency.

EPA's proposal would extend emission reduction requirements to natural gas transmission equipment that was not covered in the 2012 rules

In addition to addressing emissions from hydraulically fractured and refractured oil wells, the proposal would extend emission reduction requirements to natural gas transmission equipment that was not covered in the 2012 rules. An important component of the 2012 rules was the requirement to capture emissions from hydraulically fractured and refractured natural gas wells, estimated to result in 95 percent total VOC reduction along with methane reduction as a co-benefit.

The EPA expects the proposed standards to reduce methane emissions by 272,000-362,000 tonnes in 2025, equivalent to 7.7-9 million tonnes of carbon

dioxide. It also expects a reduction of 154,000-163,000 tonnes of ozone-forming VOCs in 2025, along with 1,720-2,270 tonnes of toxic air pollutants. In 2020, EPA estimates the proposal to cost $150 million to $170 million and provide climate benefits of $200 million to $210 million. By 2025, the EPA cost estimates rise to $320 million to $420 million with climate benefits of $460 million to $550 million.

According to EPA, the proposed standards are based on current industry practices and technology, and would complement voluntary measures including its Methane Challenge Program and upcoming Department of the Interior (DOI) rules covering natural gas production on federal lands. In April 2014, the DOI's Bureau of Land Management issued a notice of rulemaking to develop a program for the capture and sale, or disposal, of waste methane from coal mines on federal lands. In June 2014, the EPA proposed revisions to its 1996 NSPS for new municipal solid waste landfills to update guidelines for existing landfills.

Methane Emissions Show Substantial Decline Despite Growing Natural Gas Production

The IPAA and API pointed to the EPA's own data that indicate a decline in methane emissions from hydraulic fracturing despite rising production levels. According to the EPA's recent GHG report, methane emissions declined by approximately 11 percent (71.5 million metric tons of CO2 equivalent) from 2005-2013 with natural gas systems accounting for a reduction of 18.9 million metric tons (Figure 2). Natural gas systems were the second largest source category of methane emissions in 2013 accounting for 157.4 MMT CO2 equivalent. Methane emissions from natural gas systems decreased by approximately 12.2 percent (21.8 MMT CO2 equivalent) since 1990 due to industry initiatives and states that have implemented rules. The ANGA noted that natural gas producers have reduced methane emissions by 38 percent while increasing production by 35 percent.

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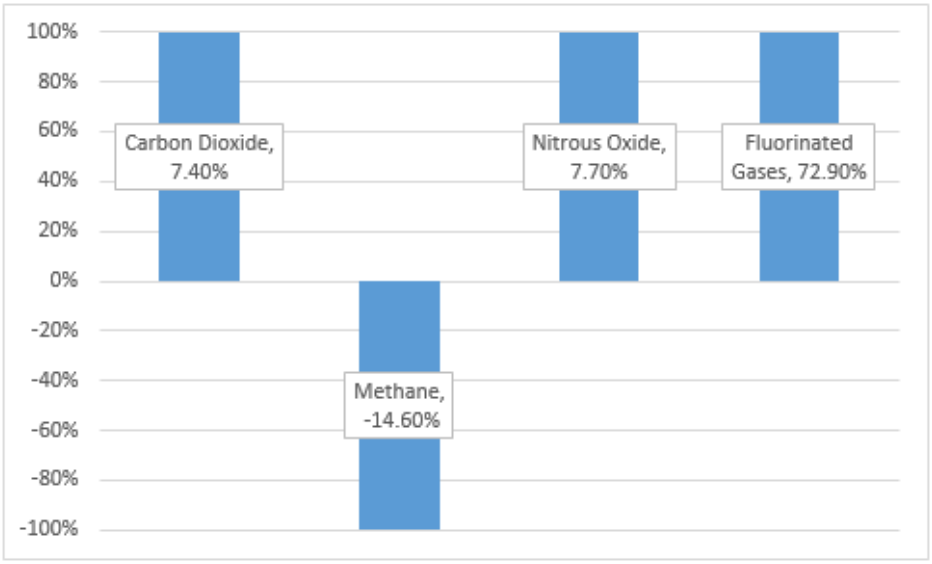
In January, EPA outlined methane reduction measures in the oil and natural gas industry, with a new goal to reduce methane emissions by 40-45 percent by 2025 from 2012 levels despite notable reductions driven by market incentives. Though oil and gas sector emissions have declined by 16 percent since 1990 with significant reductions in well completions, the EPA projects more than 25 percent increase in emissions by 2025 in the absence of additional measures. According to the Agency, methane has 25 times the heat-trapping potential of carbon dioxide over a 100-year period. Methane emissions accounted for approximately 10 percent of U.S. greenhouse gas emissions in 2012, of which nearly 30 percent was attributed to the production, transmission, and distribution of oil and natural gas.

Figure 2 - Percentage Change in U.S. GHG Emissions, 1990-2013

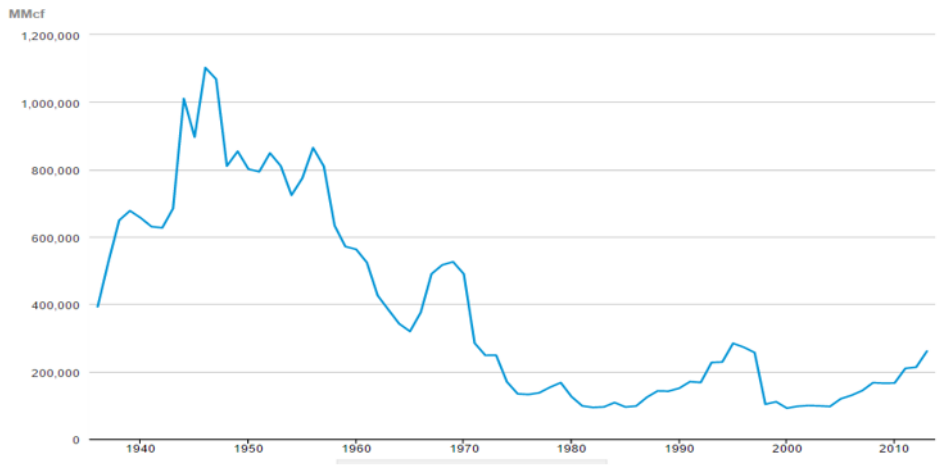


Source: EPA

Sen. Heitkamp pointed to the drastic reductions in methane emissions through voluntary efforts – flaring in North Dakota has fallen to 17 percent in 2015, down from 36 percent in 2011. According to the Energy Information Administration, in 2013, more than 260 billion cubic feet of methane was flared in the U.S. Low natural gas prices in many tight shale regions – such as North Dakota's Bakken Shale – and inadequate pipeline capacity to transport gas to the market has led companies to flare methane produced with oil on site (Figure 3). This trend is expected to change with improvements in pipeline infrastructure. Leaked methane is of more concern than flared methane as flaring converts the methane to carbon dioxide, which has a lower heat-trapping potential.

Low natural gas prices in many tight shale regions – such as North Dakota's Bakken Shale – and inadequate pipeline capacity to transport gas to the market has led companies to flare methane produced with oil on site

Figure 3 - U.S. Natural Gas Vented and Flared



Source: EPA

In February 2015, Sen. Heitkamp introduced a bill that would require the DOI to review permit requests to gather unprocessed natural gas on federal and Indian lands in a timely manner, and in May introduced legislation to expedite oil and natural gas pipeline permits to reduce flaring and harness oil and natural gas in a cleaner way. In September, the Senate unanimously passed Sen. Heitkamp's bill to reauthorize and make permanent a program aimed to improve efficiency and effectiveness of drilling permit reviews, and in December approved funding for the effort.

Voluntary Approaches to Curb Methane Reductions Facilitate Innovation

To facilitate methane reduction, oil and gas companies are implementing innovative technologies, including Forward-Looking Infrared (FLIR) technology to address fugitive emissions, vapor recovery towers, efficient compressors, and programs for leak detection and repair surveys. Companies participating in the Environmental Defense Fund's Methane Detectors Challenge are engaged in a competitive approach to develop cost-effective technologies for real-time methane detection to simplify leak-fixing. One of the companies involved in the Natural Gas STAR Program, Chesapeake Energy, the second largest natural gas producer in the U.S., is using a survey unit that can be mounted in different transportation modes. Another natural gas company, the Appalachia-focused Range Resources uses several techniques to minimize air emissions from field operations including the collection of hydrocarbons in shallower formations.

The ONE Future Coalition, a group initiated by leading natural gas producer Southwestern Energy, aims to reduce methane emission from the entire natural gas value chain. Members include natural gas distributor AGL Resources Inc., electricity and gas distributor National Grid, upstream operators Apache Corporation and Hess Corp, pipeline operator Kinder Morgan and mining giant BHP Billiton.

In July, the EPA proposed a voluntary framework for oil and natural gas producers to commit to methane-reduction and reporting targets. The EPA's proposed Methane Challenge Program builds on the 1993 Natural Gas STAR Program which provides a platform for companies making methane reduction commitments. Gas STAR partners have implemented more than 50 specific cost-effective technologies and practices across the oil and natural gas value chain. Through 2013, Gas STAR partner companies have reported voluntary methane emission reductions of over one trillion cubic feet (over 400 MMTCO2e).

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The EPA intends to work with other federal agencies, companies, and initiatives such as the ONE Future and Downstream Initiative to encourage innovation and transparency, facilitating adoption of methane-reducing technologies and practices. The Methane Challenge Program will complement regulatory actions, provide incentives and opportunities for voluntary methane emission reduction efforts, primarily from existing methane emission sources. While the Natural Gas STAR program requires partners to make a general commitment on a company-wide or regional level and report emission reduction actions, the Methane Challenge Program will create a structure for

companies to make specific ambitious commitments and annually submit data and information through the GHG Reporting Program to transparently track progress. According to EPA, ambitious commitments and transparency will facilitate information sharing regarding accomplishments and progress, encouraging broad industry adoption of best practices.

Draft Guidelines Provide Pathway to Address Existing Sources in Ozone Nonattainment Zones

The EPA's methane reduction proposal includes control technique guidelines (CTGs) to address existing sources in ozone nonattainment areas – those that do not meet the ground-level ozone standards – and states in the Ozone Transport Region. CTGs provide an analysis of available, cost-effective technologies to control VOC emissions from covered oil and gas sources. VOCs are a precursor to ozone and controls to reduce VOCs also reduce methane as a co-benefit. According to the EPA, existing sources covered by CTGs can use the same technologies and practices proposed for new sources, demonstrating the availability of technologies to cost-effectively deal with new and existing emission sources. Colorado and Wyoming are effectively regulating existing and new operations based on these technologies.

CTGs also cover VOC emissions from existing equipment and processes in the oil and natural gas industry. CTGs do not impose legal requirements but provide information on cost-effective control technologies to help states and local agencies determine reasonably available control technology (RACT) for emissions reductions from processes and equipment. Specifically, they include model regulations for states that choose to adopt EPA's recommended controls to reduce VOC emissions.

Control Technique Guidelines provide model regulations for states that choose to adopt EPA's recommended controls to reduce VOC emissions

The Ozone Transport Region encompasses 11 northeast states – Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont, Washington D.C. and portions of northern Virginia. The EPA expects the CTGs to reduce approximately 82,000 tons of VOCs annually, and yield approximately 220,000 tons of methane reductions as a co-benefit. It estimates the control measures to cost $76 million annually. States have flexibility in determining approaches to implement RACT and costs depend on measures taken by states to reduce emissions.

Looking forward, important shale regions including the Bakken (ND, MT) and Eagle Ford (TX) plays will need extended pipeline infrastructure to utilize green completion technology to capture natural gas produced with oil. Although the EPA's proposal targets new oil and gas wells, processing equipment and storage facilities, it lays the groundwork to ultimately address methane leaks from existing infrastructure as well. If low oil prices continue, the new methane emission compliance costs would put increased financial strain on exploration and production companies.

Disclosures Section

RESEARCH RISKS

Regulatory and Legislative agendas are subject to change.

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